

# Project Startup Report

**Project Name:** GIS Image Log

**Agency:** North Dakota Department of Transportation

**Business Unit/Program Area:** DOT Information Technology

**Project Sponsor:** Doug Faiman

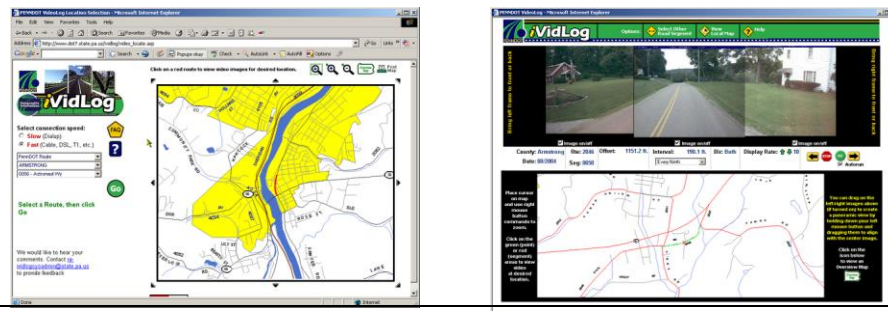
**Project Manager:** Brian Bieber

## Project Description

The purpose of the project is to create a web-enabled geographically-driven Image Log application that will utilize current Pavement Management collected images as well as current North Dakota GIS infrastructure. Users will have the ability to geographically select their area of interest and jump to that point of the Image Log. Once the user is at their area of interest they will be able to “drive” the images to view that portion of the highway.

Also included in this project will be a process that will extract, transform, and load the Pathway Services images from their proprietary data format to a format that can be utilized in a web environment.

Below is an example of an application currently in production at the Pennsylvania DOT. The GIS Image Log project is based off of this application.



## Business Need or Problem

There are 2 main areas that will be addressed by migrating the Image Log to a web application. Both concern usability, one addresses immediate needs and the other addresses a long term departmental goal.

The immediate need is accessibility; currently only those users with 100GB connections can effectively utilize the desktop image log. Offices that have T1 lines or less can access the data but it is extremely slow, from 10 to 20 times slower than the central office users. In fact, the 4 districts without a fiber connection no longer attempt to use the Image Log. By creating a web based application (thin client) the Image Log can be used by all personnel within the DOT no matter the connection speed.

One of the long term goals of the Department is to increase GIS usage. The DOT feels that GIS-centric applications are easy to learn and once the basic functions are learned; those skills can be transferred to other GIS-centric applications. GIS is inherently visual and casual users can graphically find information about their area of interest without formal training (i.e. the Google Earth effect). Also GIS shows complex spatial relationships that cannot be shown in textual reports, another advantage for casual users. This application will be designed so that other spatial datasets/applications can be easily integrated into the Image Log system, thereby leveraging the Image Log experience into other GIS-centric applications.

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Key Metrics		
Project Start Date	Estimated Length of Project	Estimated Cost
August 31 <sup>st</sup> , 2006	9 months	\$229,200

Benefits to Be Achieved	
Project Objectives	Measurement Description
GIS Enabled	Users will geographically select image log starting point.
Platform neutral	System is usable with NDDOT standard web browser and has the ability to incorporate other spatial datasets.
Usable in low connection speed offices	System will be usable and perform the same in all NDDOT offices.
System in production in a cost effective manner	System built within allocated budget of \$229,200. System built within current infrastructure.
Create a process to update images each year when the highway system is assessed	Administration of system after initial installation is less than 80 hours per year
State Agency Access Contractor Access External Access	System is accessible outside State firewall

Cost/Benefit Analysis
<p>Below are actual cost efficiencies that were realized after implementing the desktop version of the Image Log software.</p> <p>Pavement Management Section – 24hrs/month  Grand Forks District Engineer – 8hrs/month  Grand Forks District – 32hrs/month  Director – Office of Operations – 5hrs/month  Design – Photogrammetry – 50 hrs/month  Design – Traffic Safety Section – 25hrs/month  Design - Archeology Section –15hrs/month  Planning – Traffic Operations – 48 hrs/month  TOTAL – 207 hrs/month – 2484 hrs/year</p> <p>The documented cost savings are only from a partial number of users. If each district realized the same savings as the Grand Forks District, the total savings would rise by another 3360 hours. The savings are from both actual savings and costs avoided. The total for the DOT is considerably larger. None of these figures include the savings realized by construction contractors, other State Agencies or take into consideration improved customer service and general public usage.</p> <p>Adding in the 7 other District savings, the total hours saved per year would be 5844 hours. PLEASE NOTE THAT THE COST SAVINGS LIST IS ONLY A PARTIAL NUMBER OF TOTAL USERS WITHIN THE DOT.</p> <p>Annual maintenance should be limited to application maintenance costs. The application hosting fees will utilize the current State GIS infrastructure. The State GIS infrastructure is robust enough to handle the application without additional resources so the GIS budget will not be affected. Currently the DOT pays for a 1.2TB NAS device that has 350 GB of free space. Any images used by the application will be stored on that device without increasing annual costs.</p> <p>Annual maintenance is estimated to be \$22,920 (\$229,200 X 10%).</p> <p>Analysis  Gross Annual Savings = # hours saved X Averaged \$ per hour</p>

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Gross Annual Savings = 5844 hours X \$20 = \$116,880

Net Annual Savings = Gross Annual Savings – Maintenance Costs

Net Annual Savings = \$116,880 - \$22,920 = \$93,960

Project Payback

Cost of Project / Net Annual Saving = Payback Period

\$229,200/93,960 = 2.45 years

**PAYBACK PERIOD = 2.45 years**

## Key Constraints or Risks

There are several risks to be aware of:

- Time - Can this project be taken from concept to production within a 10 month period?  
Several factors should mitigate this risk. The identified contractor has several similar production applications in place. They are familiar with the technology and the resources needed to complete the project. Time management will be an integral part of the project plan. It is not just a detailed schedule but also the Project Managers (DOT) responsibility to monitor the contractor progress and determine where deficiencies lie and act upon them.
- Technology – Most pavement collection systems already have a web based system. This application will have to be reversed engineered to work with a web browser. Will Pathways work with the contractor to build a solution that not only works now but also with future versions?  
This solely lies with the contractor's ability to build a solid relationship with Pathway Services. Pathway is aware of our interest in combining the image log with GIS and they haven't voiced concern yet. Any technological hurdles with Pathways will need to be identified and solution provided before further work will be allowed.
- Flexibility – Since additional modules have not been identified, will the final solution be flexible enough to integrate them in the future?  
A GIS Web Portal Framework will have to be integrated into the scope document. It has to be written where the contractor acknowledges what the DOT's long term vision is. The Image Log is not the end game but the possible beginning of integrating other spatial data with the Image Log.
- ESRI version changes from 9.1 to 9.2. Backwards compatibility is always an issue with ESRI products. A test environment will need to be developed and upgrades will have to be tested and coordinated before being released to production.
- ArcIMS technology (current) versus ArcGIS Server (possible). Which is the most viable long term solution?  
The contractor will need to explore both options and suggest which solution will provide the most cost effective solution as well as taking into consideration maintenance costs of each.